Resonate Command Module for the Oracle 8i Server

User Guide

Version 2.0

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Preface

About the Command Module

The Resonate Command Module for Oracle 8*i* Server lets you use Resonate Commander Solutions 2.0 to monitor an Oracle 8*i* database server. In turn, the Command Module sends information to the local Active Agent, which sends statistics and events to the Resonate Commander Solutions Controller via the local Active Agent.

Who should read this book

You should be familiar both with Commander Solutions 2.0 and the Oracle 8i Server in general before reading the parts of this guide that describe the events and statistics made available by this Command Module.

This guide assumes you are already familiar with the concepts and terminology associated with Commander Solutions 2.0. This guide also assumes you already understand the meaning and significance of the statistics reported and the events generated by the Command Module because you are familiar with monitoring and managing an Oracle 8i Server.

To learn about Commander Solutions and how to use the Commander Solutions Console, read the ***Resonate Commander Solutions Administrator Guide*** and the ***Resonate Commander Solutions Monitor Guide***.

How this book is organized

This book describes how the Command Module works and how to configure it.

- *Chapter 1* introduces the Command Module and describes how it works.
- *Chapter 2* tells you how to install the Command Module on Solaris.
- *Chapter 3* tells you how to install the Command Module on Windows 2000 or Windows NT 4.
- *Chapter 4* describes the statistics reported by the Command Module.
- *Chapter 5* describes the events generated by the Command Module.
- *Appendix A* describes how to do a silent installation and uninstallation on Solaris.
- *Appendix B* describes how to do a silent installation and uninstallation on Microsoft Windows.
- The *Glossary* defines relevant terms.

Typographic conventions

Computer output and file names appear in `this font`. Commands, URLs, and other text that you type appear in **`this bold font`**.

Variables appear in italics, *like this*.

Important new terms appear in bold, **like this**, and are defined in the glossary. Elements from the graphical user interface, such as buttons and dialogs, also appear in bold.

Contacting Resonate

You can reach Resonate Technical Support as follows:

Web Site	**http://www.Resonate.com/support**
e-mail	**support@Resonate.com**
Telephone	1-877-RESONATE (737-6628)

Resonate Technical Support staff responds to telephone and e-mail comments 7 days a week, 24 hours a day.

For Resonate Sales call 408.548.5500.

Resonate welcomes your comments. Send comments by e-mail to: **comments@Resonate.com**

CHAPTER 1

Introducing the Command Module

Product overview

Install the Command Module for the Oracle 8i Server to extend the power of Commander Solutions to include monitoring your Oracle 8i database server.

Using the Command Module and the Active Agent, you can monitor the health and performance of your Oracle 8i Server in two different ways:

- View certain statistics that tell you how well your database server is doing.
- Have the Command Module look for certain conditions that might indicate a problem with your application server. When the Command Module detects those conditions, it sends appropriate events to the local Active Agent to be forwarded to the Controller. Once the Controller has been notified of an event, it can take any combination of suitable actions to deal with the problem:
  - Run diagnostic tests to gather more information
  - Notify authorized personnel of the event

Install the Command Module on any computer that can connect over the network to the database server. You must be running the Oracle SNMP agent on the database server.

To execute, the Command Module requires that an Active Agent be installed and running on the same host as the Command Module. The

Command Module sends statistics and events to the Active Agent to then be reported to the Controller Host.

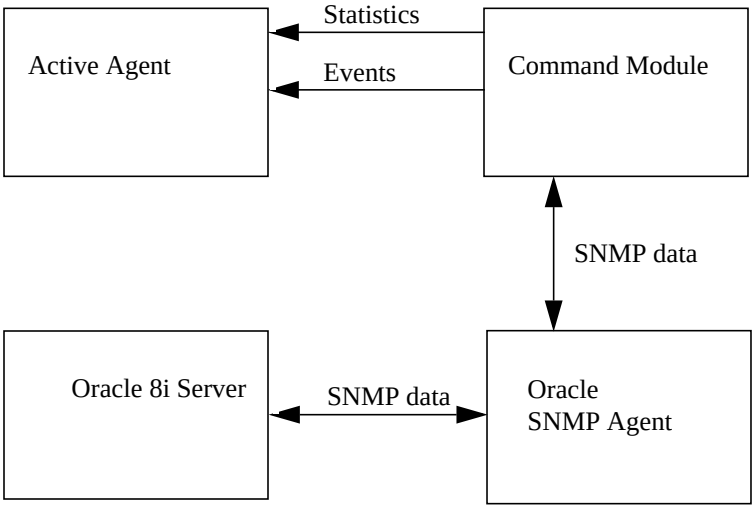

Figure 2 Communication between Command Module, Active Agent, SNMP Agent, and Database Server

After you have installed the Command Module, the Active Agent reads the Command Module capabilities file (`cm_oracledb.cap`) to learn about the:

- Statistics the Command Module will report on
- Events the Command Module will send to the Active Agent

Monitoring uses SNMP

The Command Module uses the SNMP protocol and the Oracle 8i Server SNMP MIB (Management Information Base) to collect certain statistics and determine the state of the database server by contacting the SNMP agent for the Oracle 8i Server. You must be running the Oracle SNMP agent for the Command Module to be able to collect statistics and perform its function.

CHAPTER 2

Installing on Solaris

This chapter describes how to install the Resonate Command Module for the Oracle 8i Server on Solaris:

In brief, to install this Command Module:

1. Log on as `root`.
2. Mount the CD-ROM (either locally or remotely).
3. Run the `runinstall-cm.sh` installation script.
4. Unmount the CD-ROM

Installation notes

Read the information in this section before installing this Command Module.

Note

Read the *Release Notes* for possible additional information regarding system requirements or installation information.

- Refer to the ***Resonate Commander Solutions Installation Guide*** Appendix B, *Reference,* for the list of any patches needed on Solaris.
- More than one kind of Command Module can be installed on a single system.
- A system with one or more Command Modules must also have a Commander Solutions Active Agent to communicate with the

Commander Solutions Controller. If an Active Agent is not already installed on the host where you are installing the Command Module, the installation script automatically installs one.

- Command Modules cannot be installed on a system that hosts a Commander Solutions Controller.
- The installation script asks for the hostnames of the primary and backup Commander Solutions Controllers (and the ports on which they are listening) only for the first Command Module. All Command Modules you install later communicate with those same Controllers (via the local Active Agent).
- The Active Agent has a log file maximum size of 10 MB. Each Command Module has a log file maximum size of 20 MB.
- A log file that reaches its size limit is closed and renamed with the `.old` suffix. A new log file is then opened with the original log file name. When the new log file reaches its size limit, the old log file is deleted, the current log file is renamed with the `.old` suffix, and then a new log file is opened with the original log file name.
- All Command Modules on a system store their log files in the same directory.
- When you install any Command Module, an Active Agent is automatically part of the installation. If later you install another Command Module on the same system, you should say yes (y) when prompted to stop and restart the Active Agent on that system to register the new Command Module with that Active Agent.
- The uninstallation script also removes the Active Agent if the script is removing the last Command Module on the system.

Synopsis of system requirements

- Processor: UltraSPARC
- Operating system: Solaris 2.6, Solaris 7 (both 32-bit and 64-bit versions), or Solaris 8 (both 32-bit and 64-bit versions)

- Protocol stack: TCP/IP
- Network: Connected to the network through an Ethernet 10/100, or Gigabit Ethernet network interface card. Other types of network interface cards are not supported.
- Free disk space: 45 MB for both the Command Module and its log files
- Memory: 256 MB

Preparing to install

The computer on which you install the Command Module must *not* be the Resonate Commander Solutions Controller but it must be able to connect to the Controller. Also, the system(s) on which you are running the Oracle database(s) must also be running the Oracle SNMP agent.

Mounting the CD-ROM filesystem

Before you can install the software on the CD-ROM you must mount the CD-ROM's filesystem. If the CD-ROM drive is directly attached to the computer on which you are installing components, read *Using a local drive* on page 7. If the drive is attached to a remote computer, read *Using a remote drive* on page 8.

Using a local drive

To mount the CD-ROM filesystem from a local drive on Solaris:

1. Log in as `root`.
2. Put the CD-ROM in the drive.
3. If Volume Manager is running, type:

   ```
   # cd /cdrom/cdrom0
   ```

   If Volume Manager is *not* running, type:

```
# mkdir /cdrom
# mount -F hsfs -o ro /dev/sr0 /cdrom
```

The CD-ROM filesystem is now mounted onto the local host.

Using a remote drive

To mount the CD-ROM filesystem from a remote drive on Solaris:

1. Put the CD-ROM in the drive at the remote host.
2. Log into the remote host as `root`.
3. Open the file `/etc/dfs/dfstab` and add the line below, then close the file.

   `share -F nfs -o ro /cdrom/cdrom0`

4. Enter this command:

   # **`shareall`**

   The CD-ROM filesystem is now available for mounting.
5. Log out from the remote host.
6. Log into the local host (the computer on which you want to install the software) as `root`.
7. Enter the following command to mount the remote filesystem on the CD-ROM:

   `# mount -F nfs` *remote_host*`:/cdrom /cdrom`

   Replace *remote_host* with the name of computer where the CD-ROM drive is located.

Installation directory convention

The Command Module for the Oracle 8i Server is installed underneath the Commander Solutions directory. If we let $RESONATE_CS denote the location of that directory, the files associated with the Command Module for Central Dispatch are all stored underneath:

`$RESONATE_CS/active_agent/extensions/cm_oracledb`

If the host does not yet have an Active Agent installed, the Active Agent files are installed under the `$RESONATE_CS/active_agent` directory. If this is the first Commander Solutions component you are installing on this host, you are prompted by the installation script to provide the pathname of the directory (which we are referring to here as `$RESONATE_CS`) in which to install the software. If one or more Commander Solutions components are already installed on this host, the installation program installs the Command Module (and, if necessary, the Active Agent) underneath the existing Commander Solutions installation directory.

Installing the Command Module

1. Mount the CD-ROM file system. See *Mounting the CD-ROM filesystem* on page 7 for details.

2. Run the script `runinstall-cm.sh` located under the `/cdrom/unix` or `/cdrom/cdrom0/unix` directory (depending on where you mounted the CD-ROM filesystem) and respond to the prompts on the screen.

3. Specify a user name as owner of the installed files and directories. In addition, specify a group name to assign to all installed files and directories.

4. Specify the location where you want to install the Command Module.

5. Indicate how many instances you want to install. You should install one instance (up to 10) for each Oracle database you want to monitor. When prompted for the instance name, either accept the default (`cm_oracledb_0`) or type in another name. Repeat this for each additional instance (if any) that you are installing.

6. If the Command Module is the first Commander Solutions component you are installing, enter the directory for log files. If the Command Module is not the first such component, the log file for the Command Module is stored under the same directory that was specified during the installation of the first component.

   The size of the log files is contained by allowing a log file to grow to only 20 Mb of information. Once that limit is reached, the `.old` suffix is appended to the name of the log file and a new log file is opened in the same location. Once the new log file reaches the 20 Mb limit, the log file with the `.old` suffix is deleted, the name of the new log file is changed by adding the `.old` suffix to it, and a new log file is opened for continued logging. This process then repeats indefinitely.

7. Enter `y` when you are asked if you wish to install the Command Module for Oracle 8.1.7.

8. Enter the number of Oracle Command Modules you want to install. This refers to the number of instances of the Command Module you wish to install.

9. Enter the name you want to give to the instance, then enter the IP address of the host where the Oracle database to be monitored by this instance is running. Continue by entering this same information for any other instances you are installing.

10. If the Command Module is the first Commander Solutions component you are installing, specify the port on which the Active Agent listens for non-SSL traffic and the port on which the Active Agent listens for SSL traffic.

11. Enter the IP address of the (primary) Controller Host and the port on which the Controller Host's Active Agent is listening.

12. Enter the IP address and port for the Backup Controller Host. (If there is no Backup Controller Host, just press Return instead of entering an IP address.)

13. Indicate whether the Active Agent to be installed along with the Command Module will use SSL or Persistent Channel Connections (or both) to communicate with the Controller Host.

14. Indicate whether you want to specify directories from which the Active Agent can run scripts in addition to the default scripts directory. If not, enter `n`. If so, enter `y`, then enter the pathname of the directory. Continue for as many additional script directories as you wish to define.

15. Verify that the installation settings are correct. If they are not, enter `n` to exit the installation so you can run it again. If they are correct, enter `y` to proceed with the installation.

16. After the installation is complete, you are asked if you wish to stop and restart the Active Agent. Answer `y` to restart the Active Agent now or `n` to restart the Active Agent later. You must restart the Active Agent to allow the Command Module to register itself with your Commander Solutions Controller.

17. When you have finished installing the software, unmount the CD-ROM. See *Unmounting the CD-ROM filesystem* on page 11 for details.

Unmounting the CD-ROM filesystem

When you have finished installing the software, unmount the CD-ROM filesystem as follows:

1. Use the `cd` command to change to a directory that is not on the CD-ROM filesystem. For example, you can change to the root directory of your local filesystem by entering the command:

   ```
   # cd /
   ```

2. Unmount the CD-ROM filesystem by entering the following command:

   ```
   # umount /cdrom
   ```

3. Eject the CD-ROM and remove it from the drive.

Installed files

Some of the more important files that the installation script installs on your computer are listed below.

Note

Although the capabilities file and threshold file are text files, you should not edit them or modify them.

- Capabilities file `cm_oracledb.cap`, which is read by the Active Agent to discover the capabilities of the Command Module, namely, the statistics it reports and the events it generates.

  The pathname of this file is:

  ```
  $RESONATE_CS/active_agent/extensions/
  cm_oracledb/conf/cm_oracledb.cap
  ```

- Thresholds file `cm_oracledb.thd`, which is read by both the Active Agent and the Command Module. There is one such file per instance that you install.

  The Active Agent reads the file to inform the Commander Solutions Console (via the Controller Host) of the thresholds recognized by the Command Module and the parameters that can be changed. The Commander Solutions Console uses this information to display the screen on which you can change the thresholds used to trigger events.

  The Active Agent reads this file to discover what the thresholds are and the values and operators for those thresholds so that it can trigger the event to be sent when a particular threshold is crossed. Each instance has its own threshold file.

  The pathname of this file for the first instance (assuming you accepted the default name) is:

```
$RESONATE_CS/active_agent/extensions/
cm_oracledb/cm_oracledb_0/conf/cm_oracledb.thd
```

- Executable file `cm_oracledb` that implements the functionality of the Command Module. There is one such file per instance that you install. Each instance has its own copy of the executable file. The pathname of this file for the first instance (assuming you accepted the default name) is:

  ```
  $RESONATE_CS/active_agent/extensions/
  cm_oracledb/cm_oracledb_0/bin/cm_oracledb
  ```

Uninstalling this Command Module

1. To uninstall this Command Module, run the following uninstallation script, where `$RESONATE` is the installation directory for the individual Command Module:

   ```
   $RESONATE/uninstall-cm.sh
   ```

2. You are told that uninstalling may result in the removal of user-defined scripts located underneath the Commander Solutions installation directory and advised to copy those scripts elsewhere before proceeding. To proceed with the installation, enter `y`.

3. Enter `y` when prompted to uninstall the Command Module for Oracle 8*i* Server.

Normally, the uninstallation script stops the Active Agent, uninstalls the Command Module, then restarts the Active Agent. However, if this is the last Command Module instance on the computer and there are no other Commander Solutions components still installed, the uninstallation script uninstalls the Active Agent instead of restarting it.

CHAPTER 3

Installing on Microsoft Windows

This chapter describes how to install the Command Module for the Oracle 8i Server on Windows 2000 Server, Windows 2000 Advanced Server, or Windows NT 4.

In brief, to install this Command Module:

1. Log on as administrator (or as a user with administrator privileges).
2. Insert the Resonate Command Modules CD-ROM into the drive.
3. Run the program *cd-rom-drive*`:\win32\setup.exe`
4. Click Install Products.
5. Click **Yes** to accept the license agreement.
6. Click Oracle 8.x Enterprise Server
7. Respond to the prompts from the InstallShield Wizard.
8. Eject the CD-ROM.
9. Reboot the system.

Installation notes

Read the information in this section before installing this Command Module.

Note

Read the *Release Notes* for possible additional information regarding system requirements or installation information.

- More than one kind of Command Module can be installed on a single system.
- A system with one or more Command Modules must also have a Commander Solutions Active Agent to communicate with the Commander Solutions Controller. If an Active Agent is not already installed on the host where you are installing the Command Module, the installation script automatically installs one.
- Command Modules cannot be installed on a system that hosts a Commander Solutions Controller.
- The installation script asks for the hostnames of the primary and backup Commander Solutions Controllers (and the ports on which they are listening) only for the first Command Module. All Command Modules you install later communicate with those same Controllers (via the local Active Agent).
- The Active Agent has a log file maximum size of 10 MB. Each Command Module has a log file maximum size of 20 MB.
- A log file that reaches its size limit is closed and renamed with the `.old` suffix. A new log file is then opened with the original log file name. When the new log file reaches its size limit, the old log file is deleted, the current log file is renamed with the `.old` suffix, and then a new log file is opened with the original log file name.
- All Command Modules on a system store their log files in the same directory.
- The uninstallation script also removes the Active Agent if the script is removing the last Command Module on the system.

Synopsis of system requirements

- Processor: Intel Pentium, PentiumPro, Pentium II, or equivalent
- Operating system: Windows 2000 Server, Windows 2000 Advanced Server, or Windows NT 4 Server
- Service Pack updates: Commander Solutions on Windows 2000 may have no Service Pack or may have Service Pack 1 or 2. If

you need to apply a Service Pack or update NIC drivers on a machine, you must first uninstall and then reinstall the Command Module after applying the updates.

- File system: Either FAT or NTFS
- Protocol stack: TCP/IP
- Network: Connected to the network through an Ethernet 10/100, or Gigabit Ethernet network interface card. Other types of network interface cards are not supported. Your computer should *not* connect to the network using Remote Access Services (RAS).
- Free disk space: 45 MB for both the Command Module and its log files
- Memory: 256 MB

Preparing to install

You can install the Command Module for Oracle 8.*x* Enterprise Server on a computer with the configuration recommended by Microsoft for running Microsoft Windows 2000 Server or Advanced Server or Microsoft Windows NT 4.

The computer on which you install the Command Module must *not* be the Resonate Commander Solutions Controller Host but it must be able to connect to the Controller Host. Also, the system(s) on which you are running the Oracle database(s) must also be running the Oracle SNMP agent.

Installation folder convention

The Command Module for the Oracle 8*i* Server is installed underneath the Commander Solutions folder. If we let %RESONATE_CS% denote the location of that folder, the files associated with the Command Module for Central Dispatch are all stored underneath:

```
%RESONATE_CS%\active_agent\extensions\cm_oracledb
```

If the host does not yet have an Active Agent installed, the Active Agent files are installed under the `%RESONATE_CS%\active_agent` folder.

If this is the first Commander Solutions component you are installing on this host, you are prompted by the installation script to provide the pathname of the directory (which we are referring to here as `%RESONATE_CS%`) in which to install the software. If one or more Commander Solutions components are already installed on this host, the installation program installs the Command Module (and, if necessary, the Active Agent) underneath the existing Commander Solutions installation folder.

Installing the Command Module

1. Close all running programs.

2. Run the installation wizard `setup.exe` located in the `win32` folder of the CD-ROM. Click on **Install Products**, click **Yes** to agree to the Licence Agreement.

Note

If a message appears about the `msvcrt.dll` library, refer to the ***Resonate Commander Solutions Installation Guide*** for details on replacing the file.

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3. Click **Oracle 8.x Enterprise Server** to launch the InstallShield Wizard.

4. Specify the location where you want to install the Command Module.

5. Indicate how many instances you want to install. You should install one instance (up to 10) for each Oracle database you want to monitor. When prompted for the instance name, either accept the default (`cm_oracledb_0`) or type in another name. Repeat this for each additional instance (if any) that you are installing.

6. If the Command Module is the first Commander Solutions component you are installing, enter the folder for log files. If the Command Module is not the first such component, the log file for the Command Module is under the same folder that was specified during the installation of the first component.

   The size of the log files is contained by allowing a log file to grow to only 20 Mb of information. Once that limit is reached, the `.old` suffix is appended to the name of the log file and a new log file is opened in the same location. Once the new log file reaches the 20 Mb limit, the log file with the `.old` suffix is deleted, the name of the new log file is changed by adding the `.old` suffix to it, and a new log file is opened for continued logging. This process then repeats indefinitely.

7. If the Command Module is the first Commander Solutions component you are installing, indicate whether the Active Agent to be installed along with the Command Module will use SSL or Persistent Channel Connections (or both) to communicate with the Controller Host.

8. If the Command Module is the first Commander Solutions component you are installing, continue the configuration of the Active Agent by specifying the location and ports for the Controller (or the primary and backup Controllers if using a High Availability configuration). You can also specify the directories from which the Active Agent can run scripts.

9. Enter the IP address of the Oracle database to be monitored by the Command Module. If you are installing any additional instances, enter the IP address of the Oracle database that each of those other instances will monitor.

10. Verify that the installation settings are correct. If not, click **Back** to make any changes. Otherwise, click **Next**, then click **Finish** to exit the InstallShield Wizard.

Before the installation continues, it first stops the Active Agent (if one was previously installed as part of the installation of another Commander Solutions component), installs the Command Module, then starts the Active Agent.

Installed files

Some of the more important files that the installation script installs on your computer are listed below.

Note

Although the capabilities file and threshold file are text files, you should not edit them or modify them.

- Capabilities file `cm_oracledb.cap`, which is read by the Active Agent to discover the capabilities of the Command Module, namely, the statistics it reports and the events it generates.

  The pathname of this file is:

  ```
  %RESONATE_CS%\active_agent\extensions\
  cm_oracledb\conf\cm_oracle.cap
  ```

- Thresholds file `cm_oracledb.thd`, which is read by both the Active Agent and the Command Module.

  The Active Agent reads the file to inform the Commander Solutions Console (via the Controller Host) of the thresholds recognized by the Command Module and the parameters that can be changed. The Commander Solutions Console uses this information to display the screen on which you can change the thresholds used to trigger events.

The Active Agent reads this file to discover what the thresholds are and the values and operators for those thresholds so that it can trigger the event to be sent when a particular threshold is crossed.

There is a thresholds file for each instance. If you accepted the default name for the first instance (for example), the pathname of this file then is:

```
%RESONATE_CS%\active_agent\extensions\
cm_oracledb\cm_oracledb_0\conf\cm_oracledb.thd
```

- Executable file `cm_oracledb.exe` that implements the functionality of the Command Module. There is an executable file for each instance. If you accepted the default name for the first instance (for example), the pathname of this file then is:

  ```
  %RESONATE_CS%\active_agent\extensions\
  cm_oracledb\cm_oracledb_0\bin\cm_oracledb.exe
  ```

Uninstalling

To uninstall this Resonate Command Module, open the **Control Panel**, select **Add/Remove Programs,** select the Resonate Command Module for Oracle by name from the list of currently installed programs, then click the **Change/Remove** button. If you are shown a screen to modify, repair, or remove the program, select the **Remove** option. Respond to any additional prompts during the uninstallation.

Normally, the uninstallation program stops the Active Agent, uninstalls the Command Module, then restarts the Active Agent. However, if this is the last Command Module on the computer and there are no other Commander Solutions components still installed, the uninstallation program uninstalls the Active Agent instead of restarting it.

CHAPTER 4

Statistics

You can monitor the health and performance of your Oracle 8*i* Server by viewing the statistics available through the Resonate Command Module for the Oracle 8*i* Server.

Status statistics

You can view the following status statistics for your Oracle 8*i* Server:

/db/oracle#db_status—This statistic tracks the status of the database server as either up or down.

/db/oracle#snmp_agent_status—This statistic tracks the status of the Oracle SNMP Agent as either up or down.

Performance statistics

You can view the following performance statistics for your Oracle 8i Server:

/db/oracle#user_commits—This statistic tracks the number of commit calls. this is incremented each time an active transaction is committed. if a user just issues a series of commit commands this will not increment for each commit; it only increments for a commit following some real work.

/db/oracle#rollback —This statistic tracks the number of user rollback operations. This statistic is incremented for each rollback command even if there is nothing to roll back.

/db/oracle#user_calls —This statistic tracks the number of user calls to the Oracle kernel. The total number of calls to the kernel should be as small as possible. See the Oracle Performance Tuning Guide to learn how to setup array processing to reduce the number of calls to the database.

/db/oracle#sort_disk —This statistic tracks the number of sort operations that had to make use of disk space.

/db/oracle#sort_memory —This statistic tracks the number of sort operations performed entirely in physical memory.

/db/oracle#redo_log —This statistic tracks the size of the redo log.

/db/oracle#redo_log_entries —This statistic tracks the number of entries generated in the redo log.

/db/oracle#physical_reads —This statistic tracks the number of blocks read from the operating system disk I/O subsystem. A disk block must be read from disk if the block cannot be found in the buffer cache.

/db/oracle#consistent_gets —This statistic tracks the number of logical reads in consistent mode.

/db/oracle#db_block_gets —This statistic tracks the number of logical reads in current mode. This statistic includes direct read (sort-on-disk) blocks.

For more information about these statistics, refer to the documentation that accompanies your Oracle 8*i* Server.

With the appropriate privilege you can subscribe to and view the statistics collected by the Command Module. For more information, refer to the ***Resonate Commander Solutions Monitor Guide*** and the ***Resonate Commander Solutions Administrator Guide***.

CHAPTER 5

Events

The Command Module informs you of the following events that can occur on your Oracle 8*i* Server:

HIGH_ROLLBACK_RATE—This condition pertains to how frequently rollbacks of data committed to the database are being performed.

HIGH_TRANSACTION_RATE —This condition pertains to how frequently transactions are being performed against the database.

CACHE_HIT_RATIO —This condition pertains to the effectiveness of the buffer cache. The normally acceptable range is 70%–80%.

SORT_OVER_FLOW_RATIO —This condition pertains to the relative number of sorts that use temporary segments.

REDO_LOG_SPACE_WAIT_RATIO —This condition pertains to memory allocation and should be less than 0.0002.

SERVER_DOWN —This condition signals that the database server has stopped responding.

SERVER_UP —This condition signals that the database server has resumed running.

SNMP_AGENT_DOWN —This condition signals that the SNMP agent has stopped responding.

The Active Agent sends these events to the Commander Solutions Controller based on the statistics it receives from the Command Module. You can view these events in the Monitor view of the Console. For more information about viewing events in the Commander Solutions Console, read the ***Resonate Commander Solutions Monitor Guide***.

APPENDIX A

Installing and Uninstalling Silently on Solaris

This appendix describes how to install and uninstall Resonate Command Modules silently on Solaris.

Silent installation

You can run the Command Module installation script with a silent (`-S`) option that lets you specify a text file that contains the responses to all the prompts that are displayed in the default interactive installation. The installation script then reads the response file instead of waiting for responses you type in via the standard input.

You can use silent installation for faster and completely consistent installation of one or more Command Modules on multiple systems. You can also use silent installation as part of a shell script to automate the installation of Command Modules.

The pathname of the template for your response file is one of the following (depending on how you mounted the Resonate Command Modules CD-ROM):

```
/cdrom/unix/install/response-cm.rsp
```

```
/cdrom/cdrom0/unix/install/response-cm.rsp
```

Note

Once you have installed a Command Module silently, you can uninstall it silently, but you cannot modify the installation silently. However, you can modify the installation interactively.

For example, once you have installed the Command Module for WebLogic with three instances monitoring three application servers, you cannot use silent installation to add a fourth instance to monitor a fourth application server. However, you can run the installation script interactively to add the fourth instance.

Contents of the response file

Edit the response file as described in the following sections to provide the necessary responses for installing the components you want to install.

General information

`BASEDIR` stores the pathname of the installation directory.

`RSNTCS_CM_LOGDIR` stores the pathname of the log directory.

`RES_USER` stores the username to be used as the owner of the files and directories that get installed.

`RES_GROUP` stores the group named to be as the group assigned to the files and directories that get installed.

`START_DAEMONS` is a flag indicating whether the Active Agent is to be started after the installation completes. Use 1 to start the Active Agent and 0 to not start the Active Agent.

Active Agent

IAA is a flag indicating whether to install the Active Agent. Use 1 to install the Active Agent and 0 to not install the Active Agent.

AGENT_PORT stores the port on which the agent listens for communications from the Controller.

AGENT_SSL_PORT stores the port on which the agent listens for SSL-based communications from the Controller.

PRIMARY_HUB_IP stores the IP address of the Primary (or only) Controller.

PRIMARY_HUB_PORT stores the port on which the Primary (or only) Controller is listening.

BACKUP_HUB_IP stores the IP address of the Backup Controller.

USE_SSL_CONNECTION is a flag indicating whether to use SSL for communications between the Active Agent and the Controller. Set the variable to either “true” or “false”.

PRIMARY_HUB_SSL_PORT stores the port on which the Primary (or only) Controller listens for SSL communications.

BACKUP_HUB_SSL_PORT stores the port on which the Backup Controller listens for SSL communications.

USE_PERSISTENT_CHANNEL is a flag indicating whether to use persistent channel communications with the Controller. Set the variable to either “true” or “false”.

SCRIPT_DIRECTORIES lists the directories that contain scripts that the Active Agent will execute when requested. Separate multiple pathnames with a space.

Command Module for Central Dispatch

Set the first variable listed (ICMCD) to 1 to install the Command Module for Central Dispatch. To prevent the installer from installing this Command Module, you can set that first variable to 0, or you can comment out or delete this section.

For the Command Modules for Central Dispatch you can assign a single instance name to the NAME_CD variable.

Set the port on which the Central Dispatch agents are listening in CD_AGENT_PORT. Set the port on which the Report Agent listens in CD_REPORT_AGENT_PORT.

Assign the hostname or IP address of any one of the nodes in the Central Dispatch site to CD_HOST. Assign the interval (in seconds) that the Command Module waits before requesting the next batch of updated statistics from the Reporter Agent to INTERVAL.

Once you have installed the Command Module interactively on one system, you need to copy the scrambled administration mode password for the Central Dispatch site (stored in the password.dat file) to the system where you will run the silent installation using the following pathname:

```
/tmp/password.dat
```

Command Module for Global Dispatch

Set the first variable listed (ICMGD) to 1 to install the Command Module for Global Dispatch. To prevent the installer from installing this Command Module, you can set that first variable to 0, or you can comment out or delete this section.

For the Command Modules for Global Dispatch you can assign a single instance name to the NAME_GD variable.

Assign the interval (in seconds) that the Command Module waits before requesting the next batch of updated statistics from the Global Dispatch Scheduler to GD_INTERVAL.

Assign to GD_ROOT_PATH the absolute pathname of the installation directory for Global Dispatch. The bin directory underneath the installation directory will be searched for the gdaction and gdctl executables that the Command Module needs to perform actions on the Global Dispatch site.

Assign the IP address of the Global Dispatch Scheduler to GD_SCHED_IP.

Once you have installed the Command Module interactively on one system, you need to copy the scrambled administration mode password for the Global Dispatch site (stored in the password.dat file) to the system where you will run the silent installation using the following pathname:

```
/tmp/gd_password.dat
```

Command Module for Oracle

Set the first variable listed (ICMORACLE) to 1 to install the Command Module for Oracle 8*i* database. To prevent the installer from installing this Command Module, you can set that first variable to 0, or you can comment out or delete this section.

You can assign up to ten different instance names (one for each database to be monitored) to NEW_ODB_INST_NAMES. Separate the names by a single space.

You can monitor up to ten different databases (one for each instance name). Assign the IP addresses of the databases to ORACLE_IP_LIST. Separate each IP address with a space. You should list as many IP addresses as instance names that you assigned to NEW_ODB_INST_NAMES.

Command Module for WebLogic

Set the first variable listed (ICMWLS) to 1 to install the Command Module for BEA WebLogic. To prevent the installer from installing

this Command Module, you can set that first variable to 0, or you can comment out or delete this section.

You can assign up to ten different instance names (one for each database to be monitored) to `NEW_WLS_INST_NAMES`. Separate the names by a single space.

You can monitor up to ten different application servers (one for each instance name). Assign the IP addresses of the application servers to `WLS_IP_LIST`. Separate each IP address with a space. You should list as many IP addresses as instance names that you assigned to `NEW_WLS_INST_NAMES`.

Command Module for Solaris

Set the first variable listed (ICMSOLARIS) to 1 to install the Command Module for Solaris. To prevent the installer from installing this Command Module, you can set that first variable to 0, or you can comment out or delete this section.

You cannot set the instance name for this Command Module to be other than `cm_solaris_0`.

Running the installation

To run the silent installation:

1. Log in to the host as root where you will run the silent installation.
2. Copy the edited response file to a directory of your choosing on that host.
3. Mount the Resonate Command Modules CD-ROM, change to the directory `/cdrom/unix` (or `/cdrom/cdrom0/unix`)
4. Run the following command:
   `./runinstall.sh -S -f` *path*`/response-cm.rsp`

   Substitute for *path* the pathname of the directory where you copied over the edited response file `response-cm.rsp`.

5. Check the log file for installation messages in:
   `/tmp/CS-install.log`

Silent uninstallation

You can run the uninstallation script for Command Modules and specify an option directing the script to read the expected responses from a response file.

The pathname of the template for your response file is one of the following (depending on how you mounted the Resonate Command Modules CD-ROM):

```
/cdrom/unix/install/uninstall-cm.rsp
```

```
/cdrom/cdrom0/unix/install/uninstall-cm.rsp
```

The response file consists of five variables for each of the Command Modules that can be installed on Solaris and one for the Active Agent:

- `REM_CM_ORACLE` for the Command Module for the Oracle 8*i* Server
- `REM_CM_WLS` for the Command Module for BEA WebLogic
- `REM_CM_SOLARIS` for the Command Module for Solaris
- `REM_CM_CD` for the Command Module for Central Dispatch
- `REM_CM_GD` for the Command Module for Global Dispatch
- `REM_ACTIVE_AGENT` for the Active Agent.

Each variable serves as a flag to indicate to the uninstallation script whether that particular Command Module should be removed. To remove a Command Module, set the variable to 1 (one).

For example, to remove the Command Module for BEA WebLogic, edit the response file so that the line with the variable `REM_CM_WLS` looks like this:

```
REM_CM_WLS=1
```

Note that there are no spaces on either side of the equals sign.

Since you do not want to uninstall the Active Agent unless you are uninstalling all of the remaining Commander Solutions components on a host, and since the uninstallation script uninstalls the Active Agent in that case anyway, you should delete the line that says:

```
REM_ACTIVE_AGENT=1
```

In the rest of the response file remove the `export` commands that do not apply, leaving only those export commands for variables that you have set to `1` (true) to enable the removal of that Command Module.

If you have installed more than one instance of the Command Module for the Oracle 8*i* Server or the BEA WebLogic Server, running the uninstallation script in silent mode always removes all instances. To remove only some (but not all) instances for those Command Modules, you must run the uninstallation script interactively.

Once you have edited a copy of the uninstall response file from the CD-ROM and saved it in a directory on the host where you will run the silent uninstallation, change to the installation directory for the currently installed Commander Solutions components, become root (if you did not log in as root), then run the following command:

`./uninstall-cm.sh -S -f` *path*`/uninstall-cm.rsp`

Substitute for *path* the pathname of the directory where you copied over the edited response file `uninstall-cm.rsp`.

APPENDIX B

Installing and Uninstalling Silently on Windows

This appendix describes how to install and uninstall Resonate Command Modules silently on Microsoft Windows.

Silent installation

A silent installation requires a response file from a verbose installation. To create a response file:

1. Log in as the system administrator.
2. Insert the Resonate Command Modules CD-ROM into the CD-ROM drive.
3. Open a command prompt and move to the folder:

   cd_rom_drive`:\win32\`*command_module_name*

   Replace *command_module_name* with one of the following:
   - `cm_beawls` for the Command Module for WebLogic
   - `cm_cd` for the Command Module for Central Dispatch
   - `cm_gd` for the Command Module for Global Dispatch
   - `cm_msiis` for the Command Module for IIS
   - `cm_mssql` for the Command Module for SQL Server
   - `cm_oracledb` for the Command Module for Oracle 8*i* Server
   - `cm_win2k` for the Command Module for Microsoft Windows 2000

– `cm_wnnt` for the Command Module for Microsoft Windows NT 4

4. Run the Setup command with the -r option for record mode and the `-f1` option to specify the absolute pathname of the response file (which must end with the file extension of `.iss`). For example, in the case of the Command Module for IIS:

   ```
   Setup.exe -r -f1c:\cm_msiis.iss
   ```

5. Complete the installation of the selected Command Module. All entries are recorded in the response file.

6. Once you have completed the interactive installation, check that the response file exists.

Assuming that you will use the silent installation to install the Command Module from a remote machine, see *Installing from a remote source* on page 39. On the local machine, you must also map the drive on the remote machine that contains the response file.

To do a silent installation after setting up the local and remote machines:

1. Insert the Resonate Command Modules CD-ROM in the remote host's CD-ROM drive.

2. Open a Command Prompt window on the local machine and change to the following folder on the mapped CD-ROM drive:

   cd_rom_drive`:\win32\`*command_module_name*

3. Run the `Setup` command with the `-f1` option to specify the absolute pathname of the response file and the `-f2` option to specify the absolute pathname of the log file for the installation. Use appropriate pathnames for your installation. For example, in the case of the Command Module for IIS you might enter this command:

   ```
   Setup.exe -s -f1h:\cm_msiis.iss -f2c:\cm_msiis.log
   ```

4. After the installation completes, check the log file for the entry: `ResultCode=0`.

5. Also check that the detailed log file created by the installation. does not have an entry of `Install Aborted`. The file is stored in the root folder of the current system disk and has the following name depending on the Command Module:

   – `.cm_cd_setup_errors.log` for the Command Module for Central Dispatch
   – `.cm_gd_setup_errors.log` for the Command Module for Global Dispatch
   – `.msiis_setup_errors.log` for the Command Module for Microsoft IIS
   – `.odb_setup_errors.log` for the Command Module for Oracle 8*i* Server
   – `.sql_setup_errors.log` for the Command Module for Microsoft SQL Server
   – `.beawls_setup_errors.log` for the Command Module for BEA WebLogic
   – `.node_setup_errors.log` for the Command Module for Microsoft Windows 2000 or Windows NT 4 (depending on the local operating system)

Silent uninstallation

A silent uninstallation requires a response file from a verbose removal. To create a response file:

1. Log in as the system administrator.

2. Insert the Resonate Command Modules CD-ROM into the CD-ROM drive.

3. Open a Command Prompt window and change to the folder:

   cd_rom_drive`:\win32\`*command_module_name*

4. Run the `Setup` command with the `-r` option for record mode and the `-f1` option to specify the absolute pathname of the response file (which must end with the file extension of `.iss`). For example, in the case of the Command Module for IIS:

   ```
   Setup.exe -r -f1c:\rem_msiis.iss
   ```

5. Choose **Remove** from the Maintenance screen and complete the removal. All entries are recorded in the response file.

6. Check that the response file exists.

See *Installing from a remote source* on page 39 for directions on setting up the local and remote machines. On the local machine, you must also map the drive on the remote machine that contains the response file.

To do a silent removal after setting up the local and remote machines:

1. Insert the Resonate Command Modules CD-ROM in the remote host's CD-ROM drive.

2. Open a Command Prompt window on the local machine and change to the following folder on the mapped CD-ROM drive:

   cd_rom_drive`:\win32\`*command_module_name*

3. Run the `Setup` command with the `-f1` option to specify the absolute pathname of the response file and the `-f2` option to specify the absolute pathname of the log file for the installation. Use appropriate pathnames for your installation. For example, in the case of the Command Module for IIS you might enter this command:

   ```
   Setup.exe -s -f1h:\rem_msiis.iss -f2c:\rem_msiis.log
   ```

4. After the installation completes, check the log file for this entry: `ResultCode=0`

5. Also check that the detailed log file created by the removal does not have an entry of `Install Aborted`. This file is stored in the root folder on the current system drive and has the following name depending on the Command Module:

   – `.cm_cd_setup_errors.log` for the Command Module for Central Dispatch
   – `.cm_gd_setup_errors.log` for the Command Module for Global Dispatch
   – `.msiis_setup_errors.log` for the Command Module for Microsoft IIS
   – `.odb_setup_errors.log` for the Command Module for Oracle 8*i* Server
   – `.sql_setup_errors.log` for the Command Module for Microsoft SQL Server
   – `.beawls_setup_errors.log` for the Command Module for BEA WebLogic
   – `.node_setup_errors.log` for the Command Module for Microsoft Windows 2000 or Windows NT 4 (depending on the local operating system)

Installing from a remote source

You can install Command Modules on one computer (the local computer) by reading the installation program and files over a network from the CD-ROM drive on another computer (the remote computer).

Note

Before you begin, verify that the local computer and the remote computer can communicate with each other using the Microsoft™ Windows network. For example, you could try to copy a file from the remote computer to the local computer.

What to do on the remote computer

1. Log on at the remote computer either as Administrator or from a user account that is a member of the Administrator group.

2. Insert your Microsoft Windows CD-ROM into the CD-ROM drive.

3. Double-click the **My Computer** icon on the desktop.

4. Right-click the CD-ROM drive icon to display the context menu, then click the **Sharing** menu item.

5. Click the **Sharing** tab in the **Properties** dialog box, select **Shared As**, then enter `CS` in the **Share Name** box.

6. Click the **Permissions** button to view the permissions to the shared CD-ROM drive. Modify the permissions if you need to. The minimum access required is Read access for the user account you will log in from on the local computer. Click **OK** when you are done, then click **OK** in the **Properties** dialog box.

7. Examine the CD-ROM drive icon in the **My Computer** window and verify that the profile of an open hand has been superimposed at the bottom of the icon—this hand indicates that sharing is enabled for the device. Leave the CD-ROM in the CD-ROM drive and continue with the next procedure.

What to do on the local computer

On the local computer:

- Map to the remote shared CD-ROM
- Install a Command Module

Mapping the remote CD-ROM drive

1. Log on at the local computer either as Administrator or from a

user account that is a member of the Administrator group.

2. Right-click the **My Computer** icon on the desktop to display its context menu and select the **Map Network Drive** menu item.

3. In the **Drive:** text box, assign an unused drive letter to the remote (network) drive.

4. In the **Path:** text box, enter the path:

   `\\`*hostname*`\CS`

   where *hostname* is the name of the remote computer.

5. Click **OK** to add the network drive to **My Computer** and **Explorer**. This drive is now accessible from your local computer.

6. In the **Connect As:** text box, enter the user name and click **OK**.

7. Enter the password.

Install a Command Module

1. Remove the Microsoft Windows CD-ROM from the remote host's CD-ROM drive and insert the Resonate Command Modules CD-ROM.

2. Double-click the **My Computer** icon, then double-click the network drive you mapped to the shared CD-ROM drive named `CS`.

3. Locate `Setup.exe` and double-click it to start the installation.

4. Install a Command Module.

What to do for additional computers

If there are other computers on which you want to remotely install Commander, prepare those computers as described in *What to do on the local computer* on page 40. When you have finished installing the

desired Command Modules on those computers, remove the CD-ROM from the remote host's CD-ROM drive. If appropriate, you should also remove the sharing of the CD-ROM drive on the remote host.

Glossary

Action Actions are commands that are pre-defined. Actions may include executing a test for additional diagnosis, sending an email, modifying a traffic management configuration parameter, rebooting a system, restarting a process, or any other accessible command or script.

Actions are taken in two ways: automatically by a pre-defined rule or manually in the Commander Solutions Console.

Action Series Action series are groups of actions that are executed in sequence or in parallel. For example, a sequential action series may include a command to disable a node in Central Dispatch, restart IIS on the node, and then re-add the node to the Central Dispatch cluster. A parallel action series would be rebooting a set of servers at the same time.

Active Agent The Active Agent is a distributed component of the Commander Solutions product. It is typically installed on any host that is to be actively managed by Commander Solutions. The agent provides access to remote systems from the Controller. This access is used to remotely execute actions, tests, and custom scripts, as well as to gather information from locally resident Command Modules. Active Agents are prerequisites for Command Modules, since all communication between the Controller and the Command Modules happens through the agent for efficiency and security. Communication between the controller and the Active Agents is authenticated and can be optionally encrypted with SSL.

Administrator The Administrator role is responsible for configuration and maintenance of the services. Users with this role will create tests, actions, rules, and other means of managing the service, as well add elements to a tier or make other modifications to the service model. This role is also a superset of the Monitor and Operator roles.

See also Monitor, Operator, Global Administrator

Calendar The Calendar is a centralized component of Commander Solutions - it is an internal feature of the Controller. The Calendar provides the ability to schedule various activities within the Commander Solutions domain. The types of activities that can be scheduled include running of tests, execution of actions, applicable times for service level enforcement, and maintenance mode for many internal Commander Solutions components.

Once scheduled in the calendar, entries can be viewed in the Commander Solutions Console in various date and time formats. Historical entries can also be seen.

Command Module Command Modules are Resonate's bridges to external applications, operating systems, and devices that together form the complex components on which e-business services are built. Each Command Module is designed with specific knowledge of today's most complex infrastructures. The primary functions of the Command Modules are to gather information in the form of statistics, apply thresholds, evaluate performance and availability, forward results to the Controller (via the Active Agents), and provide a series of optional tuning and corrective actions.

Command Modules require Active Agents to be co-resident on the same host in order to communicate with the Controller. The Active Agent is also responsible for a process called auto-discovery through which the agent detects any new Command Modules, and reports their capabilities to the Controller.

Commander Solutions Console The Commander Solutions Console (CSC) is the name for the user interface for Commander Solutions. There are two main functions of CSC: monitoring and configuration. CSC is displayed in a Web browser. Pages are loaded depending on the level of access provided to the user. Access to CSC can be secured using SSL.

Controller The Controller is the central management server for a Commander Solutions domain. The Controller is responsible for: all communication to the Active Agents, correlation and thresholding of statistics and events, maintenance of the service model, enforcement of the service level objectives, rule definition, action execution, user management, and historical and real-time monitoring. The Controller is also responsible for management of the statistics and events in the database as well as the general configuration of Commander Solutions' components such as the Calendar and Test Engine.

There is only one primary controller in a domain. The Controller supports fail-over to a backup system, providing that one exists.

Correlation Correlation is the process of comparing two or more events within the Commander Solutions system. The correlation within Commander Solutions allows for common Boolean expressions (AND, OR, & NOT) to be used for comparing multiple events, as well time periods.

Dashboard The Dashboard is a graphical interface within the Commander Solutions Console that provides ready access to critical service level performance and availability information. The dashboard uses dials and meters that are easy to recognize and employ in an operations center where problems need to be detected at a quick glance.

Derived Statistic Derived Statistics are those that are generated from other raw statistics in the system. Derived Statistics are associated with either a service or a tier. They consist of aggregates of the same statistic. For example, if every element within a tier is reporting CPU load, then a derived statistic for the tier may be the average of the CPU Load for all elements in the Tier. Derived statistics are generated by applying common mathematical functions to data stored in the database, such as SUM, AVG, MIN, MAX, and STDEV. Once generated, Derived Statistics are treated as any other statistic; they can be viewed and graphed and thresholds can be applied.

Domain The Commander Solutions domain defines the extent of the services, tiers, and elements being managed by one redundant-pair of Controller hosts. This includes the database, the remote and central test engines, the rule engine, the Active Agents, and the Command Modules.

Element Elements are the smallest logical component of the service definition. They are contained within tiers. An element traditionally represents an application that is somehow in the critical path of delivering a service; however the element could also be a hardware device such as a firewall or switch.

Most elements are pre-configured by Commander Solutions through a process involving Command Modules and Active Agents.

Event An event is the result of some condition being met. Thresholds being crossed, test statuses changing, actions failing, and so on, are all examples of conditions that would generate an event. The user and the internal system must define what conditions under which events

are generated. For example, by defining a URL test that must pass or fail, the user is expressing the need for an event.

Events are a critical part of the system since it is through events that rules get triggered, policies get enacted, and service levels are measured.

Global Administrator Users with the Global Administrator role have all of the privileges of the other roles plus they are responsible for creating users and updating licenses.
The Monitor, Operator, and Administrator roles can be assigned to a user on a per service basis. This allows the flexibility to define users that have administrative rights to one service, but only monitoring rights to another.

See also Monitor, Operator, Administrator

Monitor This is the lowest level of user role with the least amount of privileges. This is a passive role. The main function of a user with this role is to monitor services by viewing the Commander Solutions Console for availability or performance breaches. Users with this role cannot configure or modify any part of the system, nor can they execute any actions.

See also Operator, Administrator, Global Administrator

Operator The Operator role is an extension of the Monitor role. Users with Operator privileges have all of the same privileges and restrictions as with the Monitor role, except that they can execute pre-defined actions.

See also Monitor, Administrator, Global Administrator

Roles Roles define the privileges assigned to a user. There are 4 pre-set roles in Commander Solutions: Monitor, Operator, Administrator, and Global Administrator.

Rule A rule is a method by which automated processes can be defined. Rules are conditional statements that are triggered by the generation of events. If an event or a combination of events occur, then a rule defines what is to happen in that case. Typically rules trigger actions, but they can also trigger e-mails or tests. See the definition of actions and tests.

For a customer, rules are ways to state conditions under which problems are automatically corrected or additional tests are automatically triggered to further diagnose the condition.
Input = events

Output = action or tests
One special use for the rule engine is to create hierarchical tests. Hierarchical tests allow for secondary and tertiary tests to be executed if (and only if) the first test meets some condition (pass or fail). The hierarchical nature of this type of test allows users to only execute certain expensive tests when needed. For example, if a URL transaction test returns a fail response, then the second test might include specific SQL-level tests that verify user login to the database, and so on. The user would not want to run the direct database login test on a regular schedule, but only if the first URL login test fails. Rules are also used to provide correlation between events on the Controller host. Correlation involves the comparison of one or more conditions or statistical values. The output of correlation is typically an event.

Service A service is a logical representation of an application or a system of applications. For example, a service may be defined as the sum of the components needed to deliver online trading. This could include firewalls, applications, operating systems, custom processes, load balancing rules, web pages, databases, and so on. A critical part of the service is that it defines the relationship of the granular entities within it. Specifically, services contain tiers, which in turn contain elements. These relationships describe data or process flow. Each service will have unique relationships. Once relationships are established, better automated-analysis and policy management can be derived.

Service Level Objective The Service Level Objective (SLO) defines the criteria by which a service is measured. The user-defined SLO becomes the de facto standard for performance and availability compliance monitoring. SLO's are tied into the Service model and reflect the business requirements for each service.

An example of an SLO is to provide better than 5 second response time on all primary pages 95% of the time. Another example is to ensure 99.9% availability over a month. Each of the SLO's can be graphically monitored using the Dashboard or one of the other tools within the Commander Solutions Console.

Scheduler See Calendar.

Statistic Statistics are primarily gathered from Command Modules, but can also come from SNMP. Statistics can be viewed in graphical format or simply stored for later correlation. It is also possible to apply thresholds to statistics. A process called statistic subscription allows users to determine which statistics will be collected from the

remote systems and stored in the database. Statistics Subscription makes data collection more efficient by flexibly setting the types of data needed for historical graphing. This process is done by choosing from a list of statistics provided by the Command Modules.

Test A test is a procedure that verifies the performance and availability of a critical service. The tests provided by Commander Solutions are focused on e-business transaction and service monitoring. The tests are run and managed by the Test Engines. Each test is intended to mimic end-user transactions. Some tests that are built-in include transactional URL tests and general TPC transaction tests for FTP or telnet or others. The goal of a test to ensure that systems or applications are functioning adequately and within specified boundaries. A test must return at least a pass or fail result. However, other data is also returned to the Controller for monitoring or historical queries. Each test returns response time for the transaction. An example of a test includes URL Page checks and transaction tests, where a specific outcome is expected. A user may choose to specify that the condition of success for a URL test is that it must retrieve the page without error within a specified time.
Tests that are pre-configured can be used to measure a Service Level Objective. They can be used for either availability measurements (pass or fail) or performance measurements (response time).

Test Engine The Test Engine is the component responsible for running tests. Multiple Test Engines can be installed at remote locations to more accurately mimic end-user experiences. All Test Engines are managed and configured by the central Controller, using the Commander Solutions Console.
An example of how multiple remote Test Engines can be used is to help troubleshoot the actual source of a problem. Take the example of a bank that has 3 data centers: one in New York, one in Houston, and one in San Francisco. Obviously, customers connecting to each of these three locations will receive different response rates. By placing Test Engines, at each of these locations and performing transaction tests regularly, the bank can more accurately determine which site is performing better and make adjustments accordingly. Additionally once the data from all three data centers is gathered collected by the central controller, special event correlation can be done to further diagnose the extent of the problem areas.

Test Series A Test Series is a grouping of tests that are defined to be interdependent. Once tests are contained within a Test Series, they are optionally executed either sequentially or in parallel. A Test Series can be used to execute a URL test on all elements in a web

server tier at the same time, or to execute a multi-step test such as ping node then check web page then execute script.

Threshold Thresholds provide a means of applying high or low watermarks to performance statistics as a way to assess over service impact. Thresholds are both preset and configurable by the administrative user. Thresholds define when events are generated and service levels are affected.
Thresholds are also applied automatically by the Command Modules and the Active Agents as a way to filter out extraneous data values that do not impact service levels.

Tier Tiers are sub-components of a service. A service may have multiple tiers. The primary use for tiers is for grouping elements with similar features and functions. Typically, a tier contains elements representing clustered or redundant applications. In a traditional three-tiered architecture, there would be a web server tier, and application server tier, and a database tier. However, another use for the tier is for creating a logical relationship between clusters or groups of elements. These relationships can help to define data flow during typical end-user transactions (i.e. end-user enters web server tier then is sent to application server tier, and so on.)

User An administrator, to limit access and the level of privilege, defines users. Users are assigned to one or more Roles. Multiple users can be configured within the system. Each person wishing to connect to the Controller host using a web browser must supply a valid user name and password. Once logged in the user will only see screens that are appropriate for their role.

User Group User Groups are aggregates of users. They can be used to provide a template for certain types of users. The user will inherit the roles assigned to them in the group. The new roles will be merged into the list of their existing roles. If the user group provides no roles then the user inherits no roles.
For example, a user named Andy has been directly assigned a monitoring role for the email service only. Andy is also a member of the Corporate Monitoring user group, which includes monitoring privileges for all web services. The total privilege level for Andy is monitor roles for email services plus all web services. If he is removed from the Corporate Monitoring group, this will not affect his email monitoring privilege.

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